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The conclusions arrived at on the subject may be briefly summed up as follows: Differences in *quantity* are only a *special case* of differences in *quality*. They are distinguished from the latter above all by the fact that the qualities, on which they are grounded, allow a fixed arrangement of the objects possessing them, that is, they can serve as criteria to distinguish, between any two of them, which precedes or follows the other in a certain fixed series of which they all form parts. Thus, for example, the resistance which different threads make to breaking gives rise to quantitative differences among them, inasmuch as of any two of them it can always be determined which will be broken more easily than the other. On the other hand, their differences, for example, of color (unless these concern only different gradations of the same color), can not be described as *quantitative* differences, because they are incapable of being employed as criteria for an arrangement in which a certain place belongs to each of the threads.

But if the aforesaid condition is indispensable in order that given differences may be described as *quantitative* differences, it is nevertheless insufficient to define completely the notion of quantity. For this we require the presence of further conditions, more directly connected with that special method of comparison which is denoted by the name of *mensuration*.

In other words, it is required that on the objects possessing the qualities in question some operation may be performed whose analogy to that of the arithmetical sum is sufficient to allow a precise meaning to be given to the phrase that one of them possesses the said quality in a degree double, triple, etc., that in which another possesses it.

Here also we have another example of the fact, already observed, that the methods employed by philosophers for the criticism of distinctions often result in the discovery of some new way of determining and justifying the distinctions which they aimed at destroying.

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DISCUSSION

LOGIC AND EDUCATIONAL THEORY

IN his courteous review of "A Primer of General Method," in No. 21 of the current volume of this JOURNAL, Professor Hibben states that any attempt to discuss logical theory from the pragmatic standpoint is almost sure to reveal certain structural weaknesses peculiar to that way of thinking, and points out several places in the text where, as he believes, defects are plainly visible.

1. For example, no pragmatist warrant can be shown to account for the systematic necessity of judgment. "The element in the feeling of compulsion which expresses logical necessity is free of all pragmatic sanction."

Upon this point it seems sufficient to say that the logical necessity which belongs to any given judgment is a particular and concrete necessity. The ground of *A*'s judgment is influenced by *A*'s interests and purpose. *B*'s different interests and purposes may lead him to form a different judgment. The logical necessity is just as truly operative in the one case as in the other. It is hardly correct, then, to say that logical necessity " swings clear of all pragmatic variability," unless you have in mind some vague, shadowy, abstract "necessity-in-general" that dwells apart from the concrete particulars of our purposive daily life.

2. Again, Professor Hibben regards as a mere assumption the idea that hypotheses are formed always with a view to action. To connect any one of the famous hypotheses of science, the nebular hypothesis, the theory of gravitation, the Copernican theory, the theory of evolution or the theory regarding the ebb and flow of the tides, with the practical needs of man "would be a most unnatural and strained procedure." By way of refuting the statement that hypotheses are started under the spur of practical interest he chooses the Copernican theory as an example, and remarks that "the view that the earth is stationary and that the sun actually rises and sets is a far more useful, convenient, and practical idea than the Copernican theory. For the practical man it stands the pragmatic test most adequately."

Precisely. But why does not the astronomer retain it? Why does he seek and find another one? Professor Hibben answers: "For the astronomer it does not work. Let him satisfy himself with a different theory."

No answer could be more satisfactory to the pragmatist. Our personal, practical interests and purposes lead us to think and speak of the sun as rising and setting, and of the earth as stationary. The astronomer employs the other theory because practical convenience decides in its favor. To quote a writer,[1] who it is but fair to admit is open to the suspicion of pragmatist tendencies, it was "not because of any sheer failure to represent celestial motions, but the growing cumbrousness of the assumptions, and the growing difficulties of the calculations."

3. A third "structural weakness" is discovered in the statement

[1] Schiller, "Humanism," p. 59.

that "advancement in intelligence means organization into a systematic whole of each bit of knowledge that we possess." This statement, it would seem, necessarily involves the acceptance of the extraordinary theory that we shape our conduct from moment to moment "by our knowledge of the ends which the complex nature of the whole implies."

It is, however, one thing, surely, to speak of the way in which our knowledge grows, of the tendency towards an ideal system, and a slightly different thing to claim to have solved the riddle of the universe; for the latter is what is practically involved in having "before us as a conscious methodological procedure the practical ends involved in the systematic whole." The pragmatist is the last man in the world to deal with things in that wholesale fashion. He is satisfied if he can solve one small problem at a time. If one were asked for a pragmatic account of the process of organization of our knowledge into a systematic whole, one could not do better than take Professor Hibben's statement. "We follow," he says, "the lead not of far-off and concealed ends, but rather of the nature of the separate parts as they are in themselves and as related to each other." Each step forward, in the solution of the practical problems daily confronting us, brings with it a larger view of the world and its meaning, a more comprehensive organization of our knowledge. Reflection upon this growth of knowledge from the relatively unorganized, the rather fragmentary systems of childhood to the more comprehensive systems of later life warrants us in speaking of a tendency towards an ideally constructed system.

4. Professor Hibben states that the disjunctive judgment, since it expresses the nature of a system not in its relation to anything else but as a self-related whole with an individuality of its own, "is certainly one logical form at least which is not concerned with the adjustment of means to ends, and of practical values, but exhibits that which is an end in itself."

If, by "a self-related whole with an individuality of its own," we mean to denote a kind of system which in its nature wholly excludes the element of human purpose, there is probably nothing more to be said. But if, on the other hand, the element of purpose enters into every idea we possess, that element may legitimately be considered, must be considered, when we attempt to exhibit the whole nature of a system in disjunctive form. The purpose is immanent, not external. We may thus set forth the essential features of the system; and by doing so we are enabled to identify our problem, and decide upon our course of action. If it is a game of curling, and after consideration you decide that to win you must either draw around the guard or raise your last stone on to the winner, you are then in a position to say which alternative you will choose. Subtract from any system the purposive element, and the remainder would be hardly worth considering.

5. So much for the logical side of the matter. On pragmatist principles knowledge is for action, and in this instance it was an interest in the practical problems of education that led into the field of logic. The important thing is the application of the doctrine to the theory of education, and here Professor Hibben has offered a few criticisms upon which some comment may be made.

There is, first, the complaint that confusion has arisen between the idea of "being interested in what one is studying," and that of "being interested in the practical utility which the subject-matter may possess." Then there is expressed the fear of a certain "dwarfing" that will inevitably follow both of intellectual power and of character if during the formative period of life the child lives in an atmosphere in which utility is regarded as the sole motive for the acquisition of knowledge. Finally there is a plea for "those indirect uses of knowledge," which are somehow "too subtle, too far-off in their effects, too complex, too cumulative for any one to detect, and name, and tabulate," but which, nevertheless, "characterize richly stored minds."

There is no need whatever for any confusion between interest in what one is studying and interest in its practical utility. It is, indeed, not only possible, but also essential, that the rich materials to be found in certain subjects should make their appeal to the student. The esthetic needs of the learner demand an acquaintance with literature and other forms of fine art. History in certain of its phases effectively meets those needs, while in other aspects it possesses a practical value. In all forms of practical activity in which students engage while carrying out their plans and purposes, there is a continual appeal to the artistic side of their natures as well as to the practical and utilitarian.

It is the business of the teacher to base his practise upon some theory of education. The more clearly he realizes the aim of education the better for his school. But it is no part of his duty to indoctrinate his pupils with educational theory. Most teachers recognize that anxious reflection by a child upon his moral and intellectual progress is not what is required, but, rather, active and interested participation in the business of life. As a matter of fact the opponents of the doctrine of interest are the chief offenders at this point. It is they who are guilty of the sin of preaching up the ultimate utility of this, that, or the other art, or study as an incentive, in a usually hopeless attempt to get their pupils to study something at present outside of the range of their interests.

The phrase, a richly stored mind, is capable of more than one interpretation. It may mean a mind stored with ideas which have been acquired for specific purposes, the achievement of a definite end, the accomplishment of this task, the solution of that practical problem; the mind of an active, inquiring, alert individual whose program of work and play has been determined by his personal needs, practical, esthetic, moral, spiritual, in the actual historical order of their development. Or it may mean a mind stored with ideas which in the order of their acquisition bore no direct relation to the learner's needs, but were carefully chosen for him by some outside authority with a view to possible future needs; the passively obedient, acquiescent, docile mind with the traditional stock of knowledge furnished by the schools, bearing the stamp of their approval, and therefore possessing that "fine flavor" of which Professor Hibben speaks with such enthusiasm.

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REVIEWS AND ABSTRACTS OF LITERATURE

Psychology: General Introduction. CHARLES HUBBARD JUDD. New York: Charles Scribner's Sons. 1907. Pp. vii + 389.

Laboratory Manual of Psychology. CHARLES HUBBARD JUDD. New York: Charles Scribner's Sons. 1907. Pp. x + 127.

These are the titles of the first two volumes of a series of three books "designed to introduce the student to the methods and principles of scientific psychology." The third volume will be devoted to a description of apparatus and the general equipment of the laboratory.

The very comprehensive aim of the "General Introduction" is stated in the preface as follows: "(1) to develop a functional view of life, . . . (2) to adopt a genetic mode of treatment, . . . (3) to give to the physiological conditions of mental life a more conspicuous place than has been given by recent writers of general text-books on psychology, . . . (4) to make as clear as possible the significance of ideation as a unique and final stage of evolution. The clear comprehension of the dominant importance of ideational processes in man's life is at once the chief outcome of our study, and the complete justification for the science of psychology. . . . This work is intended to develop a point of view which shall include all that is given in the biological doctrine; while at the same time it passes beyond the biological doctrine to a more elaborate principle of indirect ideational adaptation."

Almost one third of the volume is devoted to the nervous system and sensation. Chapter II. is an admirable presentation of the evolution of the nervous system. Beginning with the results of Jennings's study of unicellular organisms, the author traces the differentiation of primitive